which are to be applied during the next twenty years for the encouragement of scientific research by women in mathematical, physical and natural sciences.

Dr. G. Canby Robinson, dean of Washington University Medical School, St. Louis, has resigned to accept a position as dean and professor of medicine in Vanderbilt University, Nashville, Tenn.

Dr. Arthur M. Pardee, professor of chemistry at Washington and Jefferson College, has been appointed professor of chemistry and head of the department at the University of South Dakota to take effect next September.

The *British Medical Journal* states that in the appointment of professors to German universities precedence is at present being given to university teachers who have left towns which have passed out of Germany's possession. The anatomist, Professor Hugo Fuchs, who had recently been appointed to Königsberg, has thus been transferred to Göttingen as Merkel's successor.

DISCUSSION AND CORRESPONDENCE

IONIZATION AND RADIATION

Recently I came across a communication by Professor R. A. Houstoun[1] in which it was proposed to explain ionization of gases by X-rays on the basis of the classical conception of electrodynamics, by considering the intereference of spherical wavelets in which the phases are distributed at random. Professor Houstoun stated:

> When X-rays pass through a gas, only a very small fraction of the molecules—in favorable circumstances, one in a billion—is ionized by them, and the extent of this ionization is unaffected by temperature. Writers on radiation seem to have difficulty in reconciling this with the wave theory of light. I venture to suggest that the difficulty arises from an imperfect comprehension of what the wave theory requires.

After applying Rayleigh's solution of the problem of the phases at random to ionization, he arrived at the conclusion:

> Thus it is not necessary to assume that X-rays consist of neutral atoms, or that the ether has a fibrous structure, or to take refuge in the nebulous phraseology of the quantum theory; the explanation follows naturally from the principle of interference as expounded by Fresnel.

This explanation of ionization occurred to me some ten years ago but I had soon to abandon it because it led to results which are at variance with facts.

Let I/r^2 denote the intensity in a wavelet at a distance r from the source, and n be the number of wavelets coincident at that distance. Then the probability of a resultant intensity greater than J is given by

$$e^{-(Jr^2/nI)}.$$

Therefore if J equals the minimum intensity necessary to ionize the molecules of a gas, the number of molecules ionized is proportional to this expression. Thus on this theory the intensity of ionization of a gas falls off exponentially as its distance from the source of X-rays is increased—a result which is contrary to the experimental fact that the intensity of ionization varies inversely as the square of the distance.

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HOW DID DARWIN WORK?

Last year Professor Francis B. Sumner published a very suggestive and interesting paper in *The Scientific Monthly* for March, dealing with "Some Perils which confront us as Scientists." In it he quoted with approval an indignant query: "Under what project did Darwin work?"—and again, "one wonders what institution or organization Newton or Darwin belong to." The solitary worker of Down seems the incarnation of scientific genius illuminating the world with the products of its own combustion. On closer inspection, however, this conception is seen to be illusory. In the whole history of science there has perhaps never been a man who worked more faithfully and persistently on a project. It was his own project to be sure; but none the less a definite project. So also,

[1] *Nature*, April 24, 1919.

there has rarely been a man who so constantly sought the cooperation of all who could and would render him assistance. The "Origin of Species" is full of acknowledgements to his friends and correspondents, without whom he would have been comparatively helpless. From a close study of Darwin's life, we arise with the conviction that it is precisely the man of genius who should be the center of a cooperating group, and that it is through such cooperation that human knowledge, at least in the biological sciences, is chiefly advanced. To-day the adequate study of even a simple species of plant, as I have found in dealing with *Helianthus tuberosus*, requires not only a general botanist, but a plant physiologist, a taxonomist, a chemist, a soil physicist, an entomologist and others. Who is so versatile that he can perform all these functions? Yet our institutions are so constituted that each department stands by itself, and cooperation is no part of the regular program. We must not permit ourselves to be dictated to by persons who can not understand our aims or the conditions under which we must work, but the state has a right to demand efficiency. Are we sure ourselves, and can we convince others, that we are not overdoing our individualism? The world needs to be made wise and honest: can we afford to refuse to work together to this end?

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A CONVENIENT DEMONSTRATION MOUNTING FOR JELLYFISHES

THE writer has found the following method of mounting jellyfishes (Scyphozoa), both convenient and satisfactory besides permitting the observation of many structures usually only clearly seen when specimens are removed from the preserving jar.

Choose from the material on hand a jellyfish whose diameter is approximately that of a Petri dish in which it then may be placed, enough 4 per cent. formalin being added to cover the specimen. After the dish has been covered, it may be forced down in a mold of fresh plaster of Paris until the space between the upper and lower halves of it is sealed, and the top of the upper half is flush with the surface of the mold. When the mold has firmly set, any obscuring plaster of Paris may be scraped from the glass, or the mold itself suitably shaped up with a scalpel. Formalin solution condensing at any time on the upper lid may be displaced by manipulation.

Perhaps the most convenient molding frame is a paper box of a size adaptable to that of the Petri dish, although it may be of any shape. It is best to vaseline the interior of the box, in order that the hardened material may come away freely. With some care, a clean-cut looking mount may be secured. If desired, the plaster of Paris part may be given a coat of shellac, making it more durable from the laboratory standpoint. Data concerning the specimen may then be placed upon it with India ink.

It is seen that the above procedure is a modification of an old laboratory trick whereby odd bits of natural history specimens such as corals, sponges, specimens in vials, etc., may be given a convenient and useful mounting.

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ORGANIZATION OF THE AMERICAN GEOPHYSICAL UNION

AT its meeting on June 24, 1919, the "American Section of the proposed International Geophysical Union" passed the following motion:

Moved: That the members of the Section who go to the Brussels meeting be constituted a committee, with power to add to its membership, to consider permanent organization of the Section—the committee, after completing a plan for such organization, to report to a meeting of the Section, to be called at the discretion of the acting chairman of the Section, for the purpose of perfecting the permanent organization. *Adopted.*

The Brussels meeting referred to is that which was held from July 18 to July 28, 1919, to organize the International Research Council, and International Unions affiliated with it.

At this conference the International Geo-